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Indian Standard

SPECIFICATION FOR VITREOUS ENAMELLED REFLECTORS FOR USE WITH ILLUMINATING DEVICE

(*First Revision*)

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3

April 1989

Indian Standard

SPECIFICATION FOR VITREOUS ENAMELLED REFLECTORS FOR USE WITH ILLUMINATING DEVICE

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards on 16 August 1988, after the draft finalized by the Ceramicware Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard was first published in 1976. In this revision, the impact test has been modified and tolerance on thickness of the sheet steel has been included.

0.3 Vitreous enamelled reflectors meant for use for illuminating device are manufactured in a variety of patterns and dimensions depending on their specific uses. It is, therefore, difficult to prescribe any specific shapes, sizes, values for luminous output, light distribution, angle of cut-off, etc, and accordingly choice of these has been left for agreement between the purchaser and the supplier. However, with a view to providing guidance, a few of the most commonly used patterns and dimensions of these reflectors have been recommended in this standard for those concerned with this item.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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*Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard prescribes the requirements and methods of sampling and test for vitreous enamelled reflectors for use with illuminating device.

2. TERMINOLOGY

2.1 For the purpose of this standard, the definitions given in IS : 2717-1979* shall apply.

3. REQUIREMENTS

3.1 Material — The steel sheet shall be of thickness as agreed to between the purchaser and the manufacturer, and the same shall not vary by more than $^{+8}_{-16}$ percent of the nominal value when determined in accordance with the method prescribed in **3.1.1.1**.

3.1.1 The recommended post-manufacture thicknesses of steel sheets for reflectors are as follows:

Effective Inner Diameter mm	*Recommended Thickness of Steel Sheet* mm
Up to 250	Not less than 0·4
Above 250 but less than 325	Not less than 0·5
325 and above	Not less than 0·6

3.1.1.1 The thickness of steel sheets shall be determined as follows:

Remove the enamel layer of the sample of reflector or a piece cut from it by immersing it, at least up to a depth of 1 cm, in molten caustic soda (sodium hydroxide) at 530 to 550°C in a stainless steel or nickel dish for a period of 15 to 30 minutes, depending on the thickness of the enamel layer. After the enamel layer has been dissolved from a minimum portion of 0·5 cm width and 3 cm length along the edge, wash the sample with sufficient water to remove the last adhering oxide layer below the enamel. Wipe the exposed metal with clean cloth and quickly dry in an air-oven to avoid rusting.

Measure the thickness of the exposed metal by means of a micrometer at three points, each

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*Glossary of terms relating to vitreous enamelware and ceramic metal systems (*first revision*).

point being at a distance of at least 1 cm from the preceding one. The average of the three measurements shall be taken as the thickness of the metal.

NOTE 1 — For the purpose of this test, it is presumed that thickness of metal of the whole ware is the same.

NOTE 2 — In case an enamelware comprises two or more components of different thicknesses welded together, each such component shall be treated as a separate specimen.

3.2 Workmanship and Finish — The contour of fabrication shall be such that there shall not be any delayed chipping at the joints or at the curled edges.

NOTE — Reflectors may be made out of one pressing or two or more pressed pieces joined together firmly by suitable means to give the desired shape.

3.2.1 The reflectors shall be enamelled on both outer and inner surfaces, and shall be reasonably free from warpage, patches, cracks, pin-holes and blisters.

3.2.2 The outer coated surface of reflectors shall be either glossy, semi-glossy or matt and of a colour as agreed to between the purchaser and the manufacturer. The colour, texture and thickness of the enamel coating shall, however, be evenly matched.

3.2.2.1 The outer enamelled surface, when tested for acid resistance in accordance with **5** of IS : 3972 (Part 2/Sec 1)-1985*, shall conform to Classes AA, A or B as agreed to between the purchaser and the manufacturer.

3.2.3 The inner surface of the reflectors shall be enamelled white to give a glossy finish, the colour, texture and thickness of which shall be evenly matched.

3.2.3.1 The inner enamelled surface, when tested for acid resistance in accordance with **5** of IS : 3972 (Part 2/Sec 1)-1985* shall conform to Classes AA or A as agreed to between the purchaser and the manufacturer.

3.2.3.2 The reflectance value (45°, 0° directional daylight luminous reflectance with green filter) of the inner enamelled surface, when tested in accordance with **4** of IS : 3972 (Part 2/ Sec 6)-1988†, shall not be less than 70 percent.

3.2.4 The enamelled surfaces, when tested for impact resistance, shall not show any instantaneous chipping at the impact point or damaged when a steel ball weighing 43 ± 1 g is allowed to fall freely from a height of 80 cm at a plain part of the reflectors, having flat area more than the cross-sectional area of the ball, so that an impact force of 3·4 kg. cm (approx) is derived. For the purpose of this test, chipping shall be considered as the fracture of enamel coating which results in spontaneous removal/breaking away of the damaged enamel flakes. Any delayed chipping or chippings on the impact face or on the opposite side of the impact face, shall not be considered for deciding failure of this test.

3.3 Patterns and Dimensions — Recommended patterns and dimensions of reflectors are given in Fig. 1 and Tables 1 to 3 read with figures given in them.

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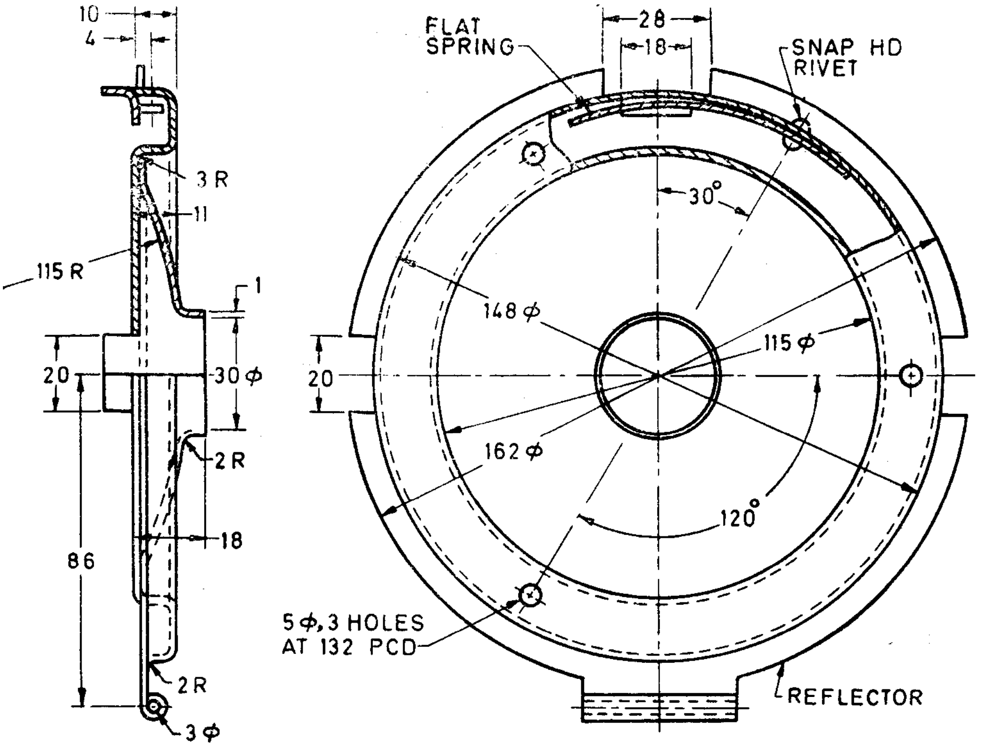
*Methods of test for vitreous enamelware: Part 2 Test methods, Section 1 Resistance to citric acid at room temperature and boiling temperature (*first revision*).

*Methods of test for vitreous enamelware: Part 2 Test methods, Section 1 Resistance to citric acid at room temperature and boiling temperature (*first revision*).

†Methods of test for vitreous enamelware: Part 2 Test methods, Section 6 Reflectance and specular gloss (*first revision*).



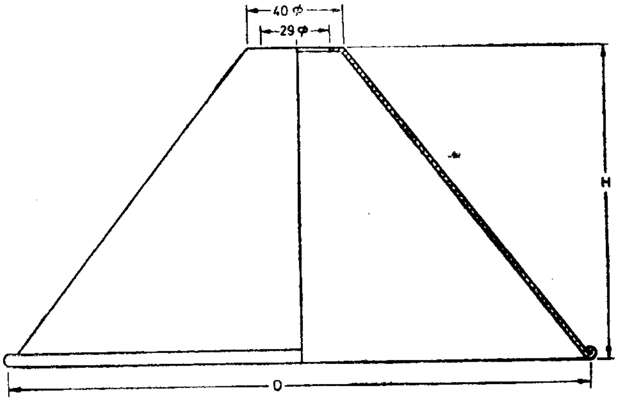
All dimensions in millimetres.

FIG. 1 SINGLE CEILING LIGHT REFLECTOR FOR RAILWAY COACHES

TABLE 1 RECOMMENDED DIMENSIONS FOR CONICAL REFLECTORS

(*Clause* 3.3)

All dimensions in millimetres.

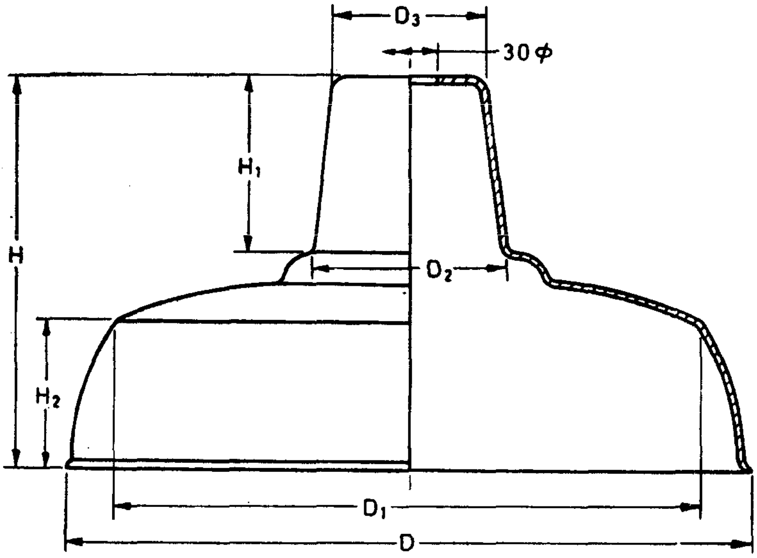


SL No.	NOMINAL SIZE	*D*	*H*
(1)	(2)	(3)	(4)
i)	250	245	90
ii)	250	245	130

TABLE 2 RECOMMENDED DIMENSIONS FOR DISPERSIVE REFLECTORS

(*Clause* 3.3)

All dimensions in millimetres.

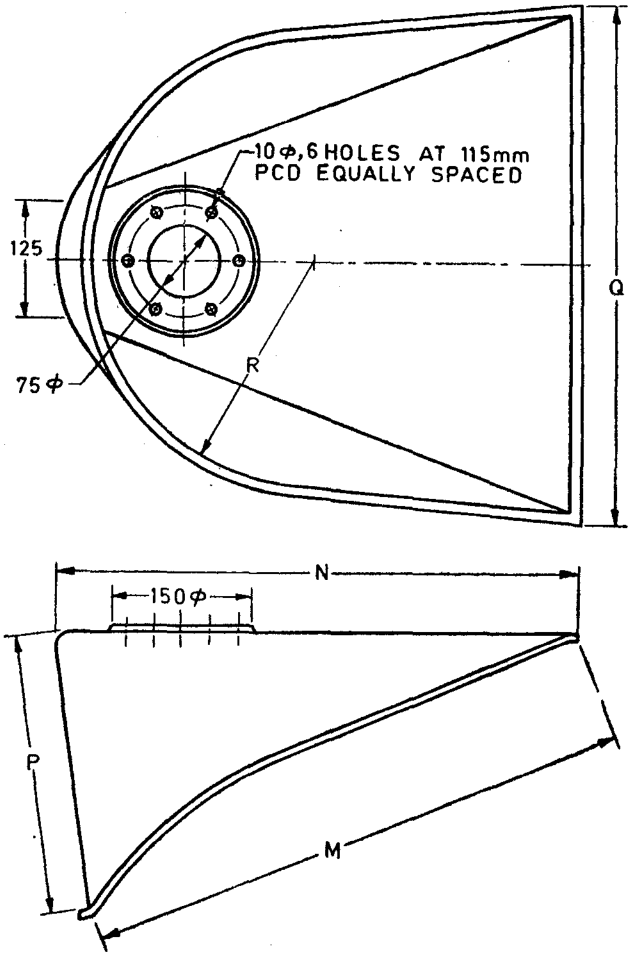


SL No.	NOMINAL SIZE	D	D_1	D_2	D_3	H	H_1	H_2
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
i)	300	300	250	70	55	165	60	60
ii)	350	350	300	100	80	200	90	75
iii)	400	400	330	100	80	240	90	90
iv)	450	450	370	140	100	330	165	115

TABLE 3 RECOMMENDED DIMENSIONS FOR DUOFLUX REFLECTORS

(*Clause* 3.3)

All dimensions in millimetres.



Sl No.	Nominal Size	*M*	*N*	*P*	*Q*	*R*
(1)	(2)	(3)	(4)	(5)	(6)	(7)
i)	500	510	440	250	530	190
ii)	600	610	570	305	630	240

3.3.1 Reflectors may also be made to other patterns and dimensions as agreed to between the purchaser and the manufacturer, provided in the case of symmetrical shapes, the effective inner diameter of reflectors, that is, the diameter measured within the mouth, is not less than that prescribed for lamps of various wattages in Table 4.

3.3.2 The sizes of holes for fitting the reflectors to the bulb holders shall be in accordance with the permissible dimensional tolerances specified for lampholders.

Note — For fitting reflectors of sizes mentioned from Sl No. (i) to (v) of Table 4 to bayonet lampholders, reference may be made to IS : 1258-1979‡.

TABLE 4 WATTAGE OF LAMPS, NOMINAL SIZES AND EFFECTIVE INNER DIAMETER OF REFLECTORS

(*Clause* 3.3.1)

Sl No.	Wattage of Lamps	Nominal Size mm	Effective Inner Diameter, *Min* mm
i)	40	250	245
ii)	60	300	295
iii)	100	350	346
iv)	150	350	346
v)	200	400	396
vi)	300	450	447
vii)	500	450	447
viii)	750	500	498
ix)	1 000	500	498
x)	1 500	500	498

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*Specification for bayonet lamp holders (*second revision*).

4. MARKING AND PACKING

4.1 Marking — Reflectors shall be marked legibly by pasting a label containing the following informations:

a) Name of the manufacturer or his recognized trade-mark, if any;

b) Nominal size;

c) Wattage of the lamp prescribed for use with the reflector; and

d) Batch number or lot number to enable the batch to be traced from records.

4.1.1 The reflectors may also be marked with the Standard Mark. Details are available with the Bureau of Indian Standards.

4.2 Packing — The reflectors shall be packed as agreed to between the purchaser and the manufacturer.

5. SAMPLING

5.1 The method of drawing representative samples of reflectors and determining the criteria of their conformity shall be as prescribed in Appendix A.

APPENDIX A

(*Clause* 5.1)

SAMPLING OF VITREOUS ENAMELLED REFLECTORS

A-1. LOT

A-1.1 In a consignment all vitreous enamelled reflectors of the same pattern and dimensions and belonging to one batch of manufacture shall be grouped together to form a lot.

A-1.2 Each lot shall be examined independently for judging its conformity to this standard.

A-2. SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY

A-2.1 Visual and Dimensional Characteristics — The number of reflectors to be sampled from each lot shall be as given in Table 5. These reflectors shall be selected at random, preferably with the use of random number tables. For random selection procedures, guidance may be had from IS : 4905-1968*.

A-2.1.1 Reflectors selected according to Table 5 shall be examined for workmanship and finish (**3.2**) and dimensions (**3.3**). Any reflector failing in one or more of the above requirements shall be termed defective. The lot shall be deemed satisfactory if the number of defective reflectors does not exceed the acceptance number given in col 3 of Table 5.

TABLE 5 SCALE OF SAMPLING AND CRITERIA FOR CONFORMITY

(*Clauses* A-2.1 *and* A-2.1.1)

LOT SIZE (1)	SAMPLE SIZE FOR VISUAL AND DIMENSIONAL TESTS (2)	ACCEPTANCE NUMBER (3)
Up to 25	5	0
26 to 50	8	1
51 to 100	13	1
101 to 300	20	2
301 to 500	32	3
501 and above	50	5

A-2.2 Thickness of Steel Sheet (3.1.1), Acid Resistance, Reflectance and Impact Resistance of Enamelled Surface (3.2.2 to 3.2.4) — For every 200 reflectors in the lot, one sample shall be tested for each of the above requirements. Same reflector may be used for various tests if test procedures permit. No failure shall occur if the lot is to be accepted under this clause.

A-2.3 The criteria given in **A-2.1** and **A-2.2** shall together judge the overall conformity of the lot to this standard.

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*Methods for random sampling.

BUREAU OF INDIAN STANDARDS

Headquarters:

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*Sales Office in Calcutta is at 5 Chowringhee Approach, P.O. Princep Street, Calcutta 700072 27 68 00
†Sales Office in Bombay is at Novelty Chambers, Grant Road, Bombay 400007 89 65 28
‡Sales Office in Bangalore is at Unity Building, Narasimharaja Square, Bangalore 560002 22 39 71

Printed at Printograph, New Delhi, India

AMENDMENT NO. 1 FEBRUARY 2006
TO
IS 8017 : 1988 SPECIFICATION FOR VITREOUS ENAMELLED REFLECTORS FOR USE WITH ILLUMINATING DEVICE

(First Revision)

(*Page* 5, *clause* **3.3.2**, *Note*, *line* 3) — Substitute 'IS 1258 : 1987‡' *for* 'IS : 1258 - 1979‡'.

(*Page* 5, *footnote marked* '‡') — Substitute the following for the existing:

'‡Specification for bayonet lamp holders (*third revision*).'

(*Page* 6, *clause* **4.1.1**) — Substitute the following for the existing clause:

'**4.1.1** *BIS Certification Mark*

The reflectors may also be marked with the Standard Mark.

4.1.1.1 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.'

(CHD 9)

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